

# Web51 - DESIGNER FULL / LITE

*Web51 is a complex project of connecting an Intel x51 compatible processor to the Realtek RTL8019AS network controller. The result is a very low-cost Ethernet interface controlled by a well-known x51 CPU..*

*The Web51 project offers turn-key applications, development system, tested hardware, or portions of the source available under the GNU GPL.*

## „Web51 – DESIGNER FULL“ package

- Populated and tested kit
- Unique MAC address
- Complete docs and project description in PDF and HTML on a CD, including unpublished portions.
- The CD also contains complete source code (including the **libk** library).
- **DESIGNER SUPPORT** ensures free updates of the commercial version for another 18 months, + support for developers.



## „Web51 – DESIGNER LITE“ package

The LITE does not include **DESIGNER SUPPORT**, otherwise it is no different from the full version.

## Basic characteristics of Web51 hardware

- Intel x51 compatible CPU – clones are produced by a number of manufacturers (Analog Devices, Atmel, Cygnal, Dallas, Intel, ISSI, SMC, Philips, Siemens/Infineon, Windbond..)
- Full-duplex IEEE 802.3 Ethernet controller, data flow indication, RJ45 connector on the PCB.
- RAM, ROM and EEPROM are all inside the CPU.  
RAM can be extended with an optional memory module that plugs into a connector on the PCB.
  - **AT89S8252** = 256 B RAM / 8 kB FLASH / 2 kB EEPROM
  - **T89C51RD2** = 1280 B RAM / 64 kB FLASH / 2 kB EEPROM
- Internal CPU watchdog and external reset controller for higher reliability and robustness.
- 16 I/O wires (entire port P1, part of P3, two pins of P2). Ready for SW-controlled I<sup>2</sup>C.
- Serial RS 232 port on a Cannon 9-pin connector, to connect to a PC-style serial port (contains signals RxD, TxD, CTS, RST, GND).
- CPU (8252 or RD2) can be ISP programmed. (8252 through 5 wires available on the PFL34 connector, RD2 through the serial RS232 line).
- DESIGN version PCB contains a small universal area for simple peripherals and two LEDs and two buttons for simple control and indication.
- Coaxial connector for DC 9-18V power (standard version has **Vcc** on the inside and **GND** on the outside contact).

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## Basic characteristics of Web51 software

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- All Web51 software is written in assembler.
- Use of high level language (such as C) is limited by 256B of internal RAM on the CPU. If the RAM is expanded, a C compiler (e.g. Keil) can be used with the full version of the libraries.
- Web51 development system can be used under almost any OS. Most utilities needed for compiling and other tasks are available in most operating systems. The development system directly supports DOS32 (MS-DOS with 32-bit support, Windows) and Linux.
- Software for such a large project must be split into many parts. Compiling and linking into the single final file is controlled by the make utility. Compilation process is detailed in “Compiling with Makefile”.
- The GNU assembler mcs51-as from the binutils package is used to compile .ASM into .OBJ. The original assembler supports many processors, such as I96, I86, HC12,.... We have added support for I51. The assembler is a part of the free distribution since version 1.12.
- Resulting .OBJ files are linked with mcs51-ld, again a modified version from the binutils.
- In some cases, bash – command interpreter – is useful for compiling. However, it is possible to compile in the DOS32 or WinXX command line.

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## Examples of applications

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- Simple controlling devices operated over TCP/IP...
- Communication module for your instruments, acting as an Internet gateway...
- Interface that can be programmed to handle any protocol...
- Collecting and sharing of data over a network...
- Extension of a RS 232/422/485 serial port...
- Connection of common appliances to a computer network...

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## Web51 distributions

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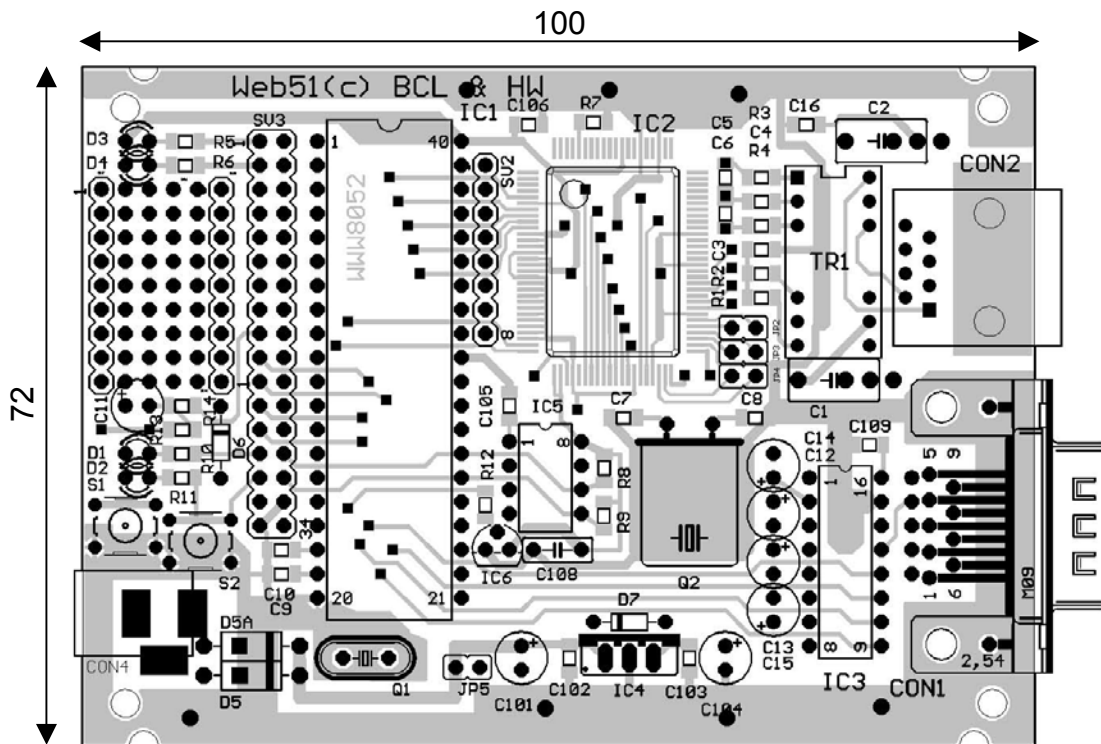
**Web51 is an open system. You can use it in many ways:**

- Get inspired by the free code and build your own application on **your own HW and SW**.
- Purchase our development system with a kit, design your own hardware and build **your own HW application**.
- Base your application on our LITE VERSION (turn-key solution), and concentrate only on the **HW of special peripherals**. We may guarantee long-term supply of modules; ask for details.
- **Need a turn-key solution?** Purchase our LITE VERSION with a complete application (basic info follows, ask for details – [Web51@hw.cz](mailto:Web51@hw.cz)).

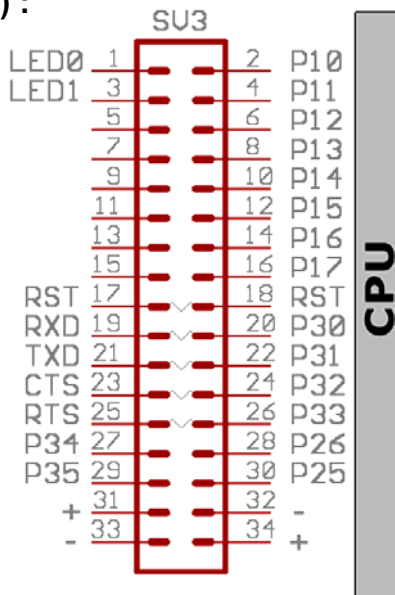
The “lite” series is suited for TURN-KEY SOLUTIONS:

- **ETHERNET-RS232 converter** – UDP/TCP/IP, supports RS485, encrypted authorization...
- **WWW I/O controller** – Remote control and monitoring of thermometers, inputs, outputs, etc. over the WWW.
- **WWW,EMAIL,SNMP I/O control** – Remote control and monitoring over WWW, EMAIL, SNMP and an authorized "telnet" client.

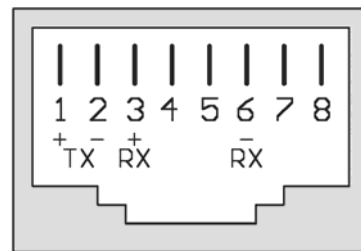
## Web51 – DESIGN KIT V.3 – Connections



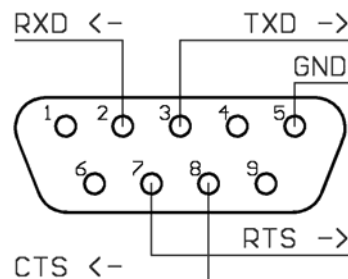
SV3 (PFL 34) :

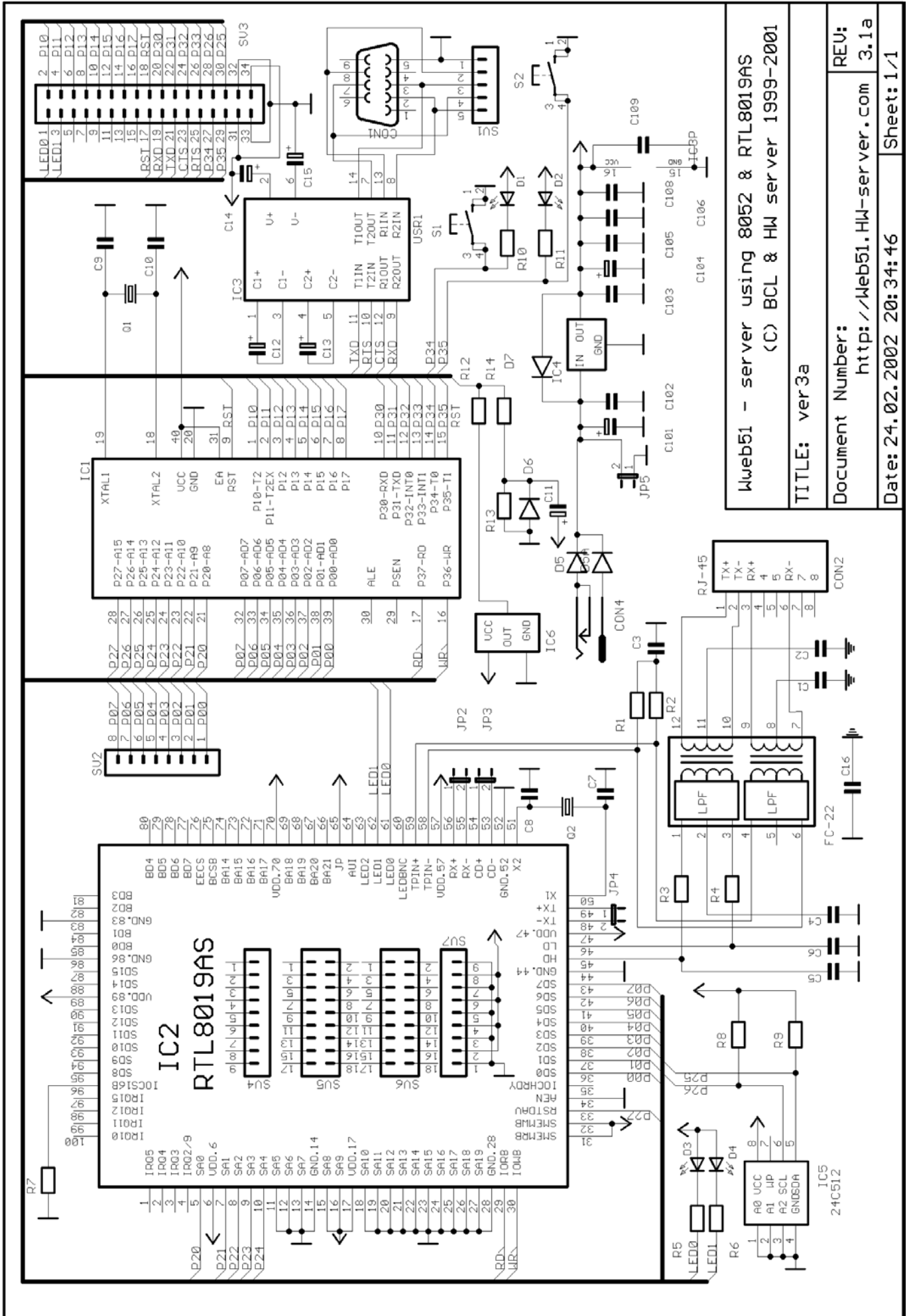


ETHERNET (RJ45) :



RS232 (CAN9F) :





Wweb51 - server using 8052 & RTL8019AS  
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